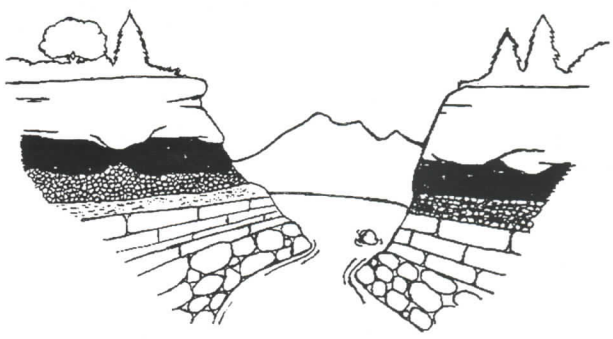
COAL MINING



Post-Visit Activity

Activity	**Edible Geology**
Setting	Classroom
Duration	45 minutes
Subject Areas	Geology, Reading, Math
Skills	Science, Measuring
Grade Level	4-5

Objective:

Students will be able to:
1. **simulate the faulting and folding of the earth's layers**
2. **simulate the effects of erosion**
3. **identify layers of the earth**

WV-IGOs:

Science - 4.9, 4.10, 4.11, 5.21, 5.24, 5.25

VOCABULARY

erosion
sediment
lithification
sedimentary rocks
shale
fossil
sandstone
coal
limestone

MATERIALS

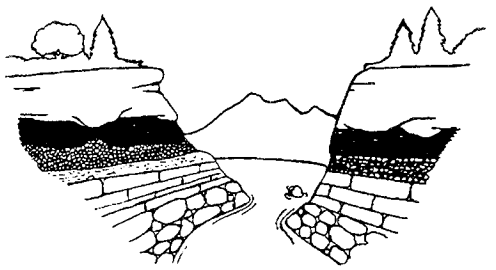
1. two boxes of raspberry gelatin
2. one box of lime gelatin
3. one box of lemon gelatin
4. Oreo cookies and graham crackers
5. banana
6. clear Pyrex or glass pan (8x12 and at least two inches deep)
7. measuring cup
8. blow dryer
9. knife, pie spatula, plates, spoons

BACKGROUND

If we were able to live several thousand years, we might be able to observe what happens to layers of minerals as they are compacted into rocks when exposed to pressure and faulting of the earth's surface. However, we will not be around that long, but we can perform experiments that can illustrate how the landscape was formed in New River Gorge. This experiment will demonstrate layers of rocks found in the gorge known as limestone, sandstone, shale (siltstone), and coal.

Limestone, estimated at 325 million years old, is the oldest type of rock found in the gorge. It was deposited when this area was covered by a shallow ocean. Sandstone and shale are layers of rock that usually overlay the older limestone. These two types of rock were formed from deposits of sand and silt washed into this area and layered on top of each other. Coal was formed from plant material, which died and collected in a swamp. The swamp was eventually covered over by layers of sand and silt. As the layers of sediment and plant materials built up, the weight from the sediment and pressure within the earth compacted the sand into sandstone, the silt into shale, and the plant material into coal.

After the layers of sediment built up and lithified into rock layers, rivers like the New River cut through the landscape to form canyons or gorges like the New River Gorge. In doing so, the layers of rock were exposed along the gorge walls. Layers of coal were also exposed allowing companies to extract the coal from the seams throughout New River Gorge.



PROCEDURES

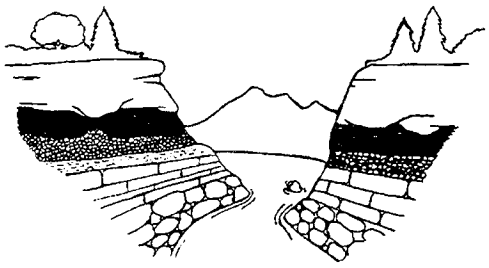
1. Review the definition of each vocabulary word.

2. As the students complete the activity, explain to them the different layers of rock and their formation.

3. *Making the limestone layer of rock*
   a. mix a box of lime gelatin in the measuring cup (use a little less water than called for)
   b. let the limestone cool about 15 minutes in the measuring cup
   c. pour into the clear pan and cut a few slices of banana on top to represent marine fossils trapped in the limestone
   d. place in a refrigerator until the gelatin is completely set

4. *Making the sandstone and shale layers of rock*
   a. mix half a box of raspberry gelatin (sandstone) and let cool about 15 minutes; then pour over the limestone layer
   b. place in a refrigerator until the gelatin is completely set
   c. mix half a box of lemon gelatin (shale) and let cool about 15 minutes; then pour over the sandstone layer
   d. place in a refrigerator until the gelatin is completely set
   e. mix half a box of raspberry gelatin (sandstone) and let cool about 15 minutes; then pour over the shale layer
   b. place in a refrigerator until the gelatin is completely set

5. *Making the coal layer*
   a. crumble up 20 Oreo cookies (coal) and spread them over the sandstone layer
   b. cut slices of banana and place on top of the coal layer (the bananas will represent plant fossils normally found in the top layer of a coal seam)
   c. mix half a box of lemon gelatin (shale) and let cool about 15 minutes; then pour over the coal and fossil layer
   d. place in a refrigerator until the gelatin is completely set



PROCEDURES *Continued*

e. mix half a box of raspberry gelatin (sandstone) and let cool about 15 minutes; then pour over the limestone layer
f. place in a refrigerator until the gelatin is completely set

6. *Carving of the Gorge*
   a. crumble up the graham crackers (soil) and place on top of the sandstone layer
   b. cut a meandering V-shaped gorge (canyon) down through the middle of the layers of rock. Remove the layers of gelatin, banana, and cookies to open up the V-shaped gorge (this is to represent the New River which cut a deep gorge through the multiple layers of rock of southern West Virginia)

7. *Eating rock* — cut the rock layers into small pieces and allow the students to eat their experiment

EVALUATION

Discuss with the class what they have learned. Where have they observed layers of rock, etc., in their area? Do they notice the differences in the rock, dirt, etc.?

EXTENSION

Remind them to look at areas where new roads have cut through the layers of rock or visit a nearby road cut to observe the different layers of rock.

TEACHER NOTES